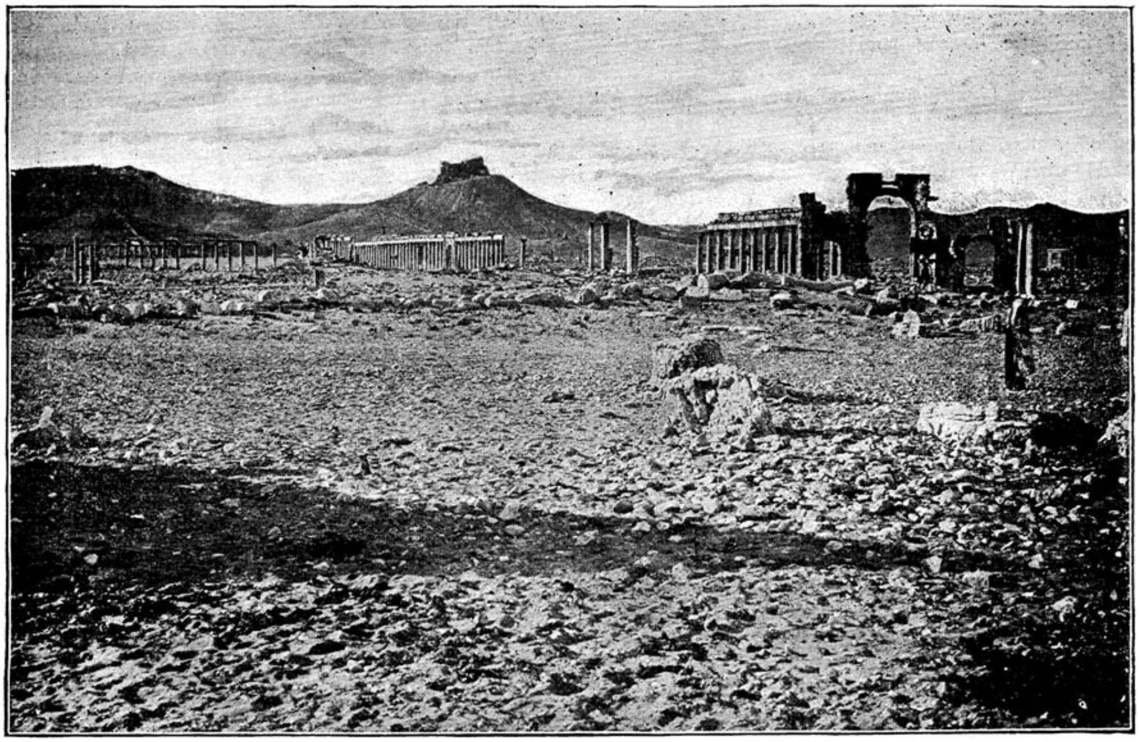
which he appends translations. The inscriptions appear to have been reproduced from De Vogüé's "Syrie Centrale," pl. 4, Nos. 28 and 29, and the translations are versions of the French rendering to be found on p. 28*f.* of the same work. We do not blame Dr. Wright for this apparently learned insertion, as no doubt many of his readers would be interested in seeing what a Palmyrene inscription looks like; but we do think he should have given some reference or indication of the source from which he took his information. It is the more to be regretted that he omitted to do this, as in his translation Dr. Wright has written "the daughter of *Zabbai*" for *Bath-Zebhīnah* of the original, not recognising the proper name, Ζηνοβία, in its semitic dress—an odd mistake to come across in a book which claims to give an account of that great queen.

In a book of travel one does not expect any remarkable purity of style, but Dr. Wright has perhaps too great a liking for fine language; as, for instance, when he describes a lady out riding as "bounding over the desert on a splendid charger, whose neck of thunder swayed hither and thither to her silken touch." But this is a minor detail, and, although we cannot honestly say that the man of science or antiquary will gather any particularly new or useful information from his pages, it would be ungenerous to discourage any one from describing, for the benefit of other people, the places and incidents from which he himself has derived pleasure. The book, in fact, would form a chatty and by no means uninteresting companion to any more solid work on the same subject, such as Socin's "Palestine and Syria," published by Baedeker, in which all historical and topographical facts concerning Palmyra and Syria in general are carefully arranged. We may add that the volume before us is prettily bound, well printed, and has plenty of illustrations, two of which are here reproduced. The one gives a view of a colonnade from the Temple of the Sun at Palmyra, while from the other some idea can be obtained of the forest of columns which are still standing on the site of that once famous city.



TRIUMPHAL ARCH, WITH CASTLE IN THE DISTANCE.

NOTES.

THE Council of the Pasteur Institute are about to organise a committee to make an international appeal for funds to erect a statue of Pasteur in Paris.

AN expedition to observe the solar eclipse next August will be sent out to Yezo from Amherst College, U.S.A., under the direction of Prof. David P. Todd. The expedition is expected to leave San Francisco next spring.

IT is reported by Reuter that steps are being taken to invite the Prince of Wales and the Secretary of State for the Colonies to visit Toronto in August 1897, when the British Association meets there, to open the new municipal buildings, which by that time will have been completed at a cost of £500,000.

AN Electrical Lighting and Power Act has recently been passed at the Cape of Good Hope, authorising regulations for the safety of the public. Mr. A. P. Trotter has been appointed Government Electrician and Inspector under this Act.

THE deaths are announced of Dr. A. J. Woïtow, Professor of Bacteriology at Moscow; Dr. Ludwig Rütimeyer, Professor of Zoology at Basel; Dr. F. P. Porcher, of Charleston, South Carolina, author of numerous works on pharmaceutical botany.

THE Executive Committee of the City and Guilds of London Institute are inviting applications for the appointment to the Salters' Company's Research Fellowship for the ensuing year. The Fellowship was founded by the Salters' Company for the encouragement of higher research in chemistry in its relation to manufactures, and particulars of the scheme under which the award is made may be had on application to the Honorary Secretary, at the head office of the Institute, Gresham College, Basinghall Street, E.C. The results of the researches by Dr. Martin O. Forster, the Salters' Research Fellow for the current year, at the Institute's Central Technical College, were communicated to the Chemical Society at its last meeting.

A NUMBER of the former students of Prof. Bonney's Geological Classes at the University of Cambridge, and at University College, London, have united to present him with his portrait as a memento of their personal esteem, and in recognition of his labours among them, and of his services to geological science. The portrait will be presented to Prof. Bonney on Monday, December 16, at 3.30 p.m., at University College, Gower Street. The work has been executed by Mr. Trevor Haddon, of the Abbey Studio, 18 Great George Street, Westminster, where it will be on view on Friday and Saturday, December 13 and 14, from 10 to 4. A platinotype reproduction of the picture has been prepared under the supervision of the artist, who will be glad to afford further information.

THE following are among the lecture arrangements at the Royal Institution before Easter:—Prof. J. G. McKendrick, six lectures (adapted to a juvenile auditory), on sound, hearing and speech; Prof. Charles Stewart, eleven lectures on the external covering of plants and animals: its structure and functions; Prof. H. Marshall Ward, three lectures on some aspects of modern botany; Lord Rayleigh, six lectures on light. The Friday evening meetings will begin on January 17, when a discourse will be given by Lord Rayleigh, on more about argon; succeeding discourses will probably be given by Prof. Burdon Sanderson, Mr. W. S. Lilly, Dr. John Murray, Mr. J. J. Armistead, Dr. Edward Frankland, Mr. A. R. Binnie, Mr. Sidney Lee, Prof. T. R. Fraser, Prof. Dewar, and others.

THE Government of India has resolved to establish an imperial bacteriological laboratory at Agra, under the directorship of Prof. Hankin, and an imperial chemical laboratory in Calcutta. According to the *British Medical Journal*, health officers are to have a six months' training in bacteriology; special diplomas, after careful training in hygiene, are to be granted by the colleges, and 1900 municipalities will be expected to appoint trained men for sanitary work. To make the scheme complete, further laboratories will probably be organised on a smaller scale in each of the great Indian presidencies, and arrangements will be made for giving six months' training of medical officers in the service. The scheme, when completed in details and in course of time, will give to India a perfect sanitary organisation and service.

THE fireball of November 22, which formed the subject of letters in NATURE of November 28 and December 5, attracted the attention of a large number of observers. Mr. W. B. Tripp, writing from Isleworth, says the meteor was observed there at about 6.50 p.m. Mr. J. H. A. Jenner noted the spectacle at Lewes at the same time, and remarked that the trail was visible for two or three minutes, and remained quite straight until it disappeared. He adds; "The path of the meteor was along the eastern sky from south to north, following a line from about the centre of the constellation Perseus towards α Ursa Major. The colour of the ball itself was reddish, and the motion seems to have been comparatively slow." This meteor was seen also at Chichester and Dover. At the latter place, the time noted by Mr. W. H. Pendlebury was 6.53 p.m., and the light emitted was d to have been "sufficiently brilliant to throw the electric ht into shadow, while the glow remained visible for between one to two seconds."

FROM a letter addressed to Mr. R. H. Scott, by Dr. J. Hann, are glad to learn that the Austrian expedition for the Society's exploration of the Red Sea has succeeded in establishing meteorological stations at Jedda, Kosseir, and Brothers Islands, about forty miles off the coast of Upper Egypt, and has provided them with self-recording barometers. At the latter station the observer is a Norwegian, in charge of the lighthouse. It is hoped that the observations will be continued for at least two years, and will furnish an important contribution to the meteorology of the district. Observations have been made at the Dutch Consulate at Jedda for some years, and by the Italians at Massowa, but, generally speaking, observations at land stations in those parts are scarce. The expedition will investigate the southern parts of the Red Sea, between Jedda and Massowa, during the winter months, and we learn that the zoological collections have up to the present time been very satisfactory.

ZOOLOGISTS will be glad to note that the editor and publisher of the *Zoologischer Anzeiger* have recently announced the steps which they are prepared to take in conjunction with Dr. Haviland Field towards a reform of existing bibliographical methods. With the new year the *Zoologischer Anzeiger* will be to some extent remodelled. It will retain its present mode of publication in approximately fortnightly numbers, as well as its division into two sections, independently paged, one dealing with scientific communications, and the other with current literature. But complete volumes of the *Anzeiger* will no longer take the form of annuals. They will be determined simply by bulk: forty sheets of "Wissenschaftliche Mittheilungen" and forty sheets of "Litteratur" will together compose a volume. The "Litteratur" section, moreover, will be obtainable in three different forms: (1) the ordinary edition, (2) an edition printed on one side of the paper only, and (3) a ticket-edition, suitable for the formation of card-catalogues. The two first editions of this "Bibliographia Zoologica" will be issued from the office of the *Zoologischer Anzeiger* in Leipzig, but the ticket-edition will be exclusively issued from the office of Dr. Field's International Bibliographical Bureau in Zürich. This combination of Dr. Field's and Prof. Carus's forces should prove of great service to students of every branch of zoological literature, which in these latter days has attained such enormous dimensions.

IT is now nearly twenty years since the brilliant, if brief, career of *Bathybius* was extinguished by the discovery that this primordial organism was in fact no organism, but a colloid precipitate of calcium sulphate produced by the action of alcohol on sea-water. Ten years later, however, *Bathybius*, or its next of kin, seemed to come to life again in the form of a remarkable protozoon parasite discovered by M. Moniez in the body cavity of certain small fresh-water Crustaceans (Ostracoda and Cladocera), and named by its discoverer *Schizogenes parasiticus*. This creature was described as an irregularly shaped disc of homogeneous, slightly refractile protoplasm, which showed no differentiation into zones and contained no nucleus, no contractile vacuole, and no granule of any kind. It was stated to exhibit a certain power of movement, and to reproduce itself by fission or constriction. It would appear, however, that *Schizogenes* is not to escape the fate of its more illustrious predecessor. Dr. G. W. Müller, well known by his monograph on Ostracoda in the Naples series, has found that the *Schizogenes* of the Ostracoda is no organism, but the viscid chitinous secretion of the so-called shell-gland. (*Zool. Anz.*, No. 486.) The secretion shows the different shapes and movements characteristic of *Schizogenes* owing to the absorption of water. *Schizogenes* can, in fact, be created at will by compressing the fresh shell-gland of an Ostracode in water beneath a cover-slip.

IT has been shown by several investigators that luminous vibrations of short wave-length are capable of producing an inflammation of the skin. It is, therefore, easy to understand that such actinic rays increase an inflammation already existing, as is the case in small-pox. The latest contribution to the knowledge of this action appears in the *British Medical Journal*, in which Dr. N. R. Finsen, of Copenhagen, gives the results obtained by keeping small-pox patients in non-actinic light. The following are the main points concerning the treatment:—(1) The exclusion of the chemical rays must be absolute; even a brief exposure to daylight may produce suppuration and its sequelæ. In other words, the skin during small-pox is as susceptible to daylight as a photographic plate, and must be kept from the chemical rays in the same way and almost as carefully. If, therefore, red window glass is employed, it is necessary for it to be of a deep red colour, and if curtains are used, they must be very thick or in several layers. When the patient takes his meals, or during the physician's rounds, artificial light—for instance, faint candle-light—may be used without any danger. (2) This method does not prevent but allows the employment of any other treatment which may be considered necessary. (3) The treatment should be commenced as early as possible; the nearer the commencement of the suppuration the smaller the chance of success. (4) The patient must remain in the red light until the vesicles have dried up.

ONE of the difficulties which attends the production of the new serum remedy for diphtheria is the uncertainty which accompanies the elaboration of toxic products by the diphtheria bacilli in culture media. This diphtheria-toxine, as it is called, has to be produced on a large scale, and it must be of a requisite degree of virulence, or it will not, when subsequently inoculated into horses, endow the blood-serum of the latter with the necessary degree of diphtheria-immunising properties. Even the bacilli taken direct from the throat of a diphtheria patient are not capable of elaborating, in culture media, toxines of a sufficient strength for the purposes of anti-diphtheritic serum production, and recourse has to be had to increasing their virulence by first inoculating them into guinea-pigs, and then transferring them to the culture media. The reason of this most inconvenient idiosyncrasy, so characteristic of diphtheria bacilli, has until recently not been surmised, but Prof. Spronck of Utrecht has unravelled the mystery in a most interesting manner.

THE last number of the *Archives des Sciences Biologiques*, published by the Imperial Institute of Preventive Medicine in St. Petersburg, gives the annual report on the anti-rabic inoculations carried out during the past year in St. Petersburg and Odessa respectively. In St. Petersburg, 224 persons were treated by Pasteur's method, and only three succumbed to hydrophobia. In two of these cases death ensued during the treatment and before, therefore, the inoculations had produced their full effect; in the other case, the patient was not treated until thirteen days after he had been bitten, and he died just three weeks after the inoculations had been completed. Amongst the rabid animals, 193 were dogs, 18 wolves, 7 cats, 5 horses, and 1 pig. At Odessa, no less than 984 persons were inoculated anti-rabically, the larger number of persons so treated being between twenty-one and forty years of age. The death-rate from hydrophobia, including those persons who died before the treatment was completed, was equal to 0·32 per cent. An instance is recorded of a death from hydrophobia having taken place one year after the anti-rabic inoculations were completed. The patient was severely bitten on his hands by a mad dog, and presented himself a week later at the Institute, although the wounds had been cauterised three hours after their infliction; the inoculations were completed on July 14, 1893, and on July 15, 1894, he died of hydrophobia. At Odessa the largest number of cases were admitted in the months of May, June, and July; but at St. Petersburg, contrary to the usual experience, the maximum number of patients were received in the spring and autumn respectively.

A NUMBER of interesting observations of the habits of the common bat and the long-eared bats in captivity are recorded by Mr. John D. Batten in *Nature Notes* for December. Common bats appear to be practically blind, yet Mr. Batten mentions that he never knew a bat fly against a window or against any obstacle: light or darkness apparently making no differences in its flight. Long-eared bats appear to see better than common bats, and their hearing is much more acute. There is seldom any difficulty in inducing bats to feed. Mr. Batten fed his bats at first on flies, moths and grasshoppers, but when these became scarce, he fed them almost entirely upon meal-worms. It is remarkable that bats, on being captured, readily adopt an entirely new method of life, and the new habits thus acquired quickly become natural. When bats are asleep in October and November, they take sometimes as long as a quarter of an hour to awaken. Mr. Batten has observed the process carefully, and finds it to be always the same. He thus describes it: "The bat when thoroughly asleep is cold, dead cold to the touch. If I then took it in my hand it would not attempt to move about or seek for food, but lie quite still. On putting it to my ear I could hear a throbbing begin, at first very slowly and not very regularly, more than a second between the beats. Gradually the throbbing became quicker and quicker until it was impossible to count the beats, at the same time the warmth of the body was increasing very rapidly, and the bat quivering visibly. At last the throbbing becomes a continuous whirr, not unlike the purring of a cat, and the body feels quite hot to the hand. Then, rather suddenly, the throbbing quiets down like water coming to the boil, it slows somewhat, and becomes almost inaudible. The bat coughs or sneezes, chatters a little with its teeth, and begins to move about expecting to be fed." Of three bats set to hibernate at the end of November in 1890, two were found dead at the end of the following January, and one was alive and perfectly strong; its fur was in good condition, and it fed well, and the hibernation had not affected its power of flight.

THE occurrence of perlitic cracks in a rock of stony texture has always been held as evidence of its alteration from an originally glassy state; but within the last two years doubt has been cast on this conclusion through Mr. W. W. Watts's observations on the pitchstone of Sandy Braes, in which perlitic cracks were claimed as traversing the quartz and other crystals as well as the matrix. In a paper read before the Royal Society of New South Wales, Mr. W. F. Smeeth has, in connection with a description of a local pitchstone resembling that of Sandy Braes, discussed fully the exact mode of origin of perlitic cracks and the features which distinguished them from other curved cracks. He points out that the artificial perlitic structure that can be made in a Canada balsam film is a "two-dimensional phase of the natural structure," and from its characters he tries to deduce those of the tri-dimensional phase. His conclusion is that natural perlites are "cracks of more or less irregularly spiralloid character, occurring in the interspaces between sets of polygonal cracks." Allowing for irregularities due to want of homogeneity in the lava, and for the fact that, whereas in the artificial structure the axes of the spirals are all normal to the surface of the film, the axes of the natural spiralloids are variable in direction, he deduces a series of possible figures for sections of true (tri-dimensional) perlitic structure. The most obvious of the characteristics shown by these theoretical sections is that the curves never meet otherwise than tangentially. That these theoretical figures are actually those seen in sections of typical perlitic rocks, affords strong evidence of the correctness of the views suggested as to their mode of formation. Passing on to consider the curved cracks in the quartz crystals (shown by the New South Wales specimen as well as by that described by Mr. Watts), he points out that the cracks, instead of meeting one another tangentially, do so at marked angles, and are therefore not truly perlitic; while he shows how these also can be imitated artificially. Reasons are given for doubting the perlitic character of cracks in lithoidal rocks claimed as such, and finally the author considers it "extremely improbable that a crystalline aggregate, consisting of individuals with various cleavages and different coefficients of contraction, would be able to develop so delicate a structure" as the true perlitic.

THE *Naturwissenschaftliche Wochenschrift* of November 17 contains a summary of some of the most important preliminary results of forty-seven balloon ascents made in Germany between June 1888 and February 1895, compiled from communications by Dr. R. Assmann in various scientific journals. In four of the ascents the balloons contained self-recording apparatus only, and of the other forty-three cases, M. Berson, an assistant in the Meteorological Office at Berlin, made thirty-six ascents (in four of which he was quite alone), and Lieut. Gross made twenty-eight ascents. The heights attained in some of the voyages were the greatest yet recorded. It was found: (1) That the air-temperature above 4000 metres was considerably lower than had been theoretically assumed, or deduced from earlier ascents. This apparently points to the fact that in the earlier ascents the thermometers were affected by solar radiation, while in the recent ascents this defect was obviated by the use of the aspirator invented by Dr. Assmann. (2) That the assumption that the decrease of temperature with height was most rapid in the lower strata of air, is untenable; the decrease was found to be fairly uniform with increasing altitude, and the isotherm of 32° F. was found to lie between 3600 and 3800 metres. (3) That the stratum between 2000 and 4000 metres was relatively too warm, owing to the greater condensation of clouds in those regions. (4) That the seasonal variation of temperature was very small above the height of 6000 metres. (5) That the inversion of temperature during winter, and at night time, up to the height of 1000 metres, appeared to be a regular phenomenon. (6) That cumulus clouds were at times found at unexpected altitudes. (7) That the surface of a massive layer of cloud affected higher strata of air thermically and electrically, like the surface of the earth. (8) That the electrical potential decreased with height, pointing to the earth as the sole source of atmospheric electricity. (9) That the aqueous vapour was unexpectedly small in even moderately high regions of the air, the variation in amount between two layers of cloud being often very great. The balloon ascents have been temporarily discontinued, with a view to discussing the existing materials.

THE Cryptogamic journal *Grevillea*, which has been published at irregular intervals since Dr. M. C. Cooke resigned the editorship, will not appear again. The papers which were intended for it have been transferred to the *Journal of Botany*, still under the editorship of Mr. James Britten. This journal will be published monthly as heretofore, but will be increased in size from thirty-two to forty-eight pages.

THE Report of the Department of Botany at the British Museum for 1894, by Mr. W. Carruthers, shows that many interesting additions were made to the Herbarium during the year, one of the most important being the collection of freshwater Algæ made by the late Dr. A. H. Hassall, which includes a number of type specimens. Collections of flowering and flowerless plants have also been obtained, by donation, exchange, or purchase, from all parts of the world, especially from British India and from our other colonies.

MR. F. N. WILLIAMS has issued a provisional and tentative list of the orders and families of British flowering plants, founded on the system of classification of certain continental botanists. He proposes to divide Phanerogamia into three "phyla," Angiospermæ, Anthospermæ, and Gymnospermæ, the second of these consisting of one family only, the Loranthaceæ. The Angiospermæ are again divided into two classes, the Dicotyledones and Monocotyledones; the Dicotyledones consist of two subclasses, the Sympetalæ (Tetracyclicæ and Isocyclicæ) and the Choripetalæ (Eucyclicæ, Phalangiata, Aphanocyclicæ, Calyciforæ, Centrospermæ, and Archichlamydeæ). The whole range of flowering plants is further grouped under 42 orders and 110 families.

APPENDIX II. of the *Bulletin of Miscellaneous Information* of the Royal Gardens, Kew, is devoted to a list of the New Garden Plants of the year 1894. It includes not only plants brought into cultivation for the first time during the year, but also the most noteworthy of those which have been reintroduced after having been lost from cultivation, and some which had not previously been properly described. In addition to species and botanical varieties, all hybrids, whether introduced or of garden origin, but described for the first time in 1894, are included. The number of hybrids is especially noteworthy in *Cypripedium* and other genera of *Orchideæ*. The total number of names in the list is about 500.

AN absolutely black body is one which both radiates and completely absorbs radiations of any wave-length. It is practically impossible to prepare such a body by artificial blackening; but Messrs. W. Wien and O. Lummer have invented a body which answers all requirements in the way of perfect blackness. This quality is impaired by reflection of any kind from the surface, and hence the inventors take care that the body in question shall be supplied with exactly those kinds of radiation which it reflects, and which its radiation lacks in consequence. The interior of a hollow sphere at any uniform temperature is in a perfect condition in this respect, since there is perfect equilibrium between the heat received and given out. By making an opening at one point, this state is only slightly disturbed, and the inside of the hollow sphere will act as a perfectly black body. From a disquisition which appears in *Wiedemann's Annalen*, it appears that the authors propose to use this body and a bolometer to test Boltzmann's law, which makes the radiation proportional to the fourth power of the absolute temperature.

Industries and Iron has commenced the issue of a series of portraits of eminent workers in the field of engineering science. Two portraits have already appeared as supplements to our contemporary—one of Lord Armstrong, in the issue of November 29, and the second, of Sir Douglas Fox, in the issue of December 6.

THE December number of *Science Progress* contains an account, by Dr. D. H. Scott, F.R.S., of the late Prof. Williamson's researches on the carboniferous flora. Other papers included in the number are on mineral transformations, by Mr. H. A. Miers; some applications of the theory of osmotic pressures to physiological problems, by Dr. E. Starling; theories of electrolysis, by Mr. C. Dampier Whetham; recent papers treating of the Upper Palæozoic beds, by Mr. Marr; and a notice of the discoveries and researches of the great physiologist, Carl Ludwig, by Dr. Leon Asher.

SOME of our readers may be interested in an ingenious puzzle which has been devised by Mr. W. Radcliffe. It consists of three sets of discs of equal sizes, each set containing the seven principal colours of the spectrum; and the problem is to arrange nineteen of these so that there will be seven groups of the same size and shape, each group containing the seven different colours. Notwithstanding that there are 5040 possible solutions to this "seven-colour puzzle," the result is by no means easily attained. It should furnish a useful exercise for young children in distinguishing colours.

THE American Ornithologists' Union held its thirteenth annual congress in Washington at the middle of last month. We understand from the New York *Nation*, that a new feature was a special memorial session, at which the late Mr. G. N. Lawrence was eulogised by Mr. D. G. Elliot, and the late Prof. Huxley by Dr. Elliott Coues. The regular scientific sessions were opened by an exhibition of unpublished water-colour paintings by Mr. Louis Agassiz Fuertes, a student of Cornell University, on whom some of the members seemed to think that the mantle of Audubon himself had fallen. Mr. W. T. Blanford was promoted from corresponding to honorary membership, and Mr. W. H. Hudson was admitted to the former. Mr. William Brewster, of Cambridge, succeeded Dr. Coues in the presidency, and the Union meets at Cambridge, Mass., next year.

THE recently-published number of the *Proceedings* of the Liverpool Geological Society (vol. vii. part 3) contains the address on "Chemistry as an Aid to Geology," by Mr. Dickson, the retiring President. He points out, among other things, the value of chemical analyses in tracing the source of drift-deposits, and particularly insists on the importance of discriminating between true *clay* and the *rock-flour* which commonly passes by the same name. Other papers in the same number deal with matters of local geology, including descriptions of new railway cuttings near Seacombe, and a moraine in the Brecknock Beacons. An important discovery of abundant *Lepidostrobi*, exhibiting various stages of development, and in actual connection with the branches of *Lepidodendron*, is recorded from St. Helens by Mr. Lomas, who also contributes an account of the Faroë Islands.

MESSRS. C. W. FAULKNER AND CO. have sent us a number of specimens of their Christmas publications, including Christmas cards, photogravure pictures, calendars, and games. What connection there is between these things and science may not be very clear at first sight. We are so used to calendars that we forget that time was when men had to look to the skies "for signs, and for seasons, and for days and years." This duty is now relegated to astronomical observers and computors, while the average man concerns himself with more mundane affairs. The pictures upon the Christmas cards are not gaudy abominations, but attractive reproductions from photographs of bits of scenery; they should remind people of the gifts of science to art, and, with the photogravure pictures, they show what excellent illustrations can now be obtained by photographic processes. As to the new games received in Messrs. Faulkner's packet, they are ingenious and offer means of pleasant relaxation from mental work.

THE first number of the *Scientific African*, which has come to hand, gives promise of a useful existence, as an exponent of South African science, arts, and crafts. The journal has a large region, full of objects and wonders of transcendent interest, as its sphere of influence. It can do much to stimulate scientific observation, and in its pages one may hope to find valuable information on the animals, minerals, and industries of South Africa. We notice in the number before us an article in support of the geological survey of Cape Colony, showing that the immediate undertaking of the survey is necessary: (*a*) in the interests of pure science, (*b*) in treating the land, (*c*) for the sake of the water supply, (*d*) for the development of the mineral resources. There is also an article on the white-tailed wildebeest or gnu, accompanied by a photograph of a male and female contained in the Selous collection in the South African Museum. Among other contributions are articles on natural gas and petroleum, a biographical notice (with portrait) of Dr. P. D. Hahn, an account of the Brandolei hot spring near the city of Worcester, South Africa; several letters, science notes, a notice of Pasteur, and a brief report of the British Association meeting at Ipswich. We wish the new journal a long and successful life.

THE forty-fifth volume of the *Jahrbuch der k.k. Geologischen Reichsanstalt* opens with a valuable series of analyses made in the laboratory of that institution by C. von John and C. F. Eichleiter. The first group of analyses are of coals of various ages and from various localities in Austria. The rest comprise ores, sedimentary rocks, water, metals, &c. This is followed by a paper on the distribution of the minerals in the lodes of Strebsko near Pribram. Kerner contributes a description of some Cretaceous plants from Lesina, which are of interest owing to the abundance of Cycadeæ. Felix Karrer issues two further instalments of his studies on the Cainozoic deposits of the Vienna basin. Dr. F. E. Suess gives the results of his investigations as to the earthquake which occurred around Neulengbach, near Krems on the Danube, on January 28, 1895. He discusses previous shocks in the same district, and concludes that the transverse axis of this earthquake area follows the strike of the mountains. C. Zahalka discusses the stratigraphical position of the "Bischitzer Uebergangsschichten," which Anton Fric regarded as the lowest member of his Iserschichten group. Zahalka divides the Bohemian chalk into ten zones, and on Fric's view the Bischitzer passage beds would belong to zone No. 8 of this series. The author, however, maintains that it belongs to his zone No. 4, or the Upper Drinowèr Knollen of Fric; that is to say, in English terminology it is transferred from the Senonian to the Lower Turonian. A second important paper on the Bohemian Chalk is contributed by J. J. Jahn, who advances the important conclusion that the Iser Schichten of Eastern Bohemia, are only a local representative of the Teplitzer Schichten, instead of being a distinct formation and of an earlier age.

Bulletin vol. ii., No. 4, of the College of Agriculture, Imperial University, Tokio, Japan, contains much gratifying evidence of scientific activity in the Far East. Dr. Oscar Loew, the professor of agricultural chemistry, continues his paper on "The Energy of the Living Protoplasm," and Mr. G. Daikubara has a second paper on "The Reserve Protein in Plants." Then follow four papers by Mr. Y. Kinoshita, dealing severally with the consumption of asparagine in the nutrition of plants, the assimilation of nitrogen from nitrates and ammonium salts by phænogams, the presence of asparagine in the root of *Nelumbo nucifera*, and the occurrence of two kinds of mannan in the root of *Conophallus konyaku*. Mr. K. Yoshimura has a note on the chemical composition of some mucilages, and makes incidental reference to the facts, of industrial importance, that the mucilage of *Sterculia platanifolia* and of *Kadzura japonica* is used in Japan for sizing paper, and that the tuberous rootstock of *Colocasia antiquorum* serves as a valuable food in Japan, where it is largely cultivated. Mr. M. Inoüye deals with the preparation and chemical composition of *tofu*, which consists principally of the protein-matter of the soya bean, is said to be as easily digestible as beef, and can therefore be used to make up the deficiency of proteids in rice, the staple food of man in Japan and China. The same author has a note on *nukamiso*, which is rice-bran in a state of lactic fermentation, and is used to soften certain vegetable foods, such as the radish and the fruit of the egg-plant, which are rendered palatable and easily digestible when left in a large quantity of *nukamiso* for about twenty-four hours. Mr. J. Cho answers in the negative the question, Does hydrogen peroxide occur in plants? Mr. Yoshimura, previously mentioned, has a note on the behaviour of hippuric acid; he concludes that decomposition of hippurates proceeds more quickly in the surface soil than in the subsoil, that it is attended with liberation of ammonia, and that it is chiefly dependent upon the action of micrococci.

THE additions to the Zoological Society's Gardens during the past week include an Arabian Baboon (*Cynocephalus hamadryas*) from Egypt, presented by Mrs. Locke King; two Tufted Umbres (*Scopus umbretta*) from Bechuanaland, South Africa, presented by Mr. F. J. Newton, C.M.G.; four Cockateels (*Calopsitta novæ-hollandiæ*), a Many-coloured Parrakeet (*Psephotus multicolor*), a Rose-Hill Parrakeet (*Platycercus eximius*) from Australia, presented by Mr. Thomas J. Manns; two Red and Blue Macaws (*Ara macao*), five Saffron Finches (*Sycalis flaveola*), two Pileated Song Sparrows (*Zonotrichia pileata*), a Guttural Finch (*Spermophila gutturalis*), a Plumbeous Finch (*Spermophila plumbea*), a White-throated Finch (*Spermophila albogularis*), a —— Finch (*Spermophila torqueola*), a Black-throated Siskin (*Chrysomitris magellanica*) from South America, a Brambling (*Fringilla montifringilla*), a Greenfinch (*Ligurinus chloris*), European, presented by Mr. A. J. Chalmers; a Red-vented Bulbul (*Pycnonotus hæmorrhous*) from India, presented by the Hon. Miss E. Dillon; a Chestnut-breasted Finch (*Donacola castanothorax*) from Queensland, presented by Mr. A. Rowney; a Hardwick's Mastigure (*Uromastix hardwicki*) rom India, presented by Mr. W. Allen; a Black Swan (*Cygnus atratus*) from Australia, deposited; two Black-necked Stilt Plovers (*Himantopus nigricollis*) from South America, a Green-headed Tanager (*Calliste tricolor*) from South-east Brazil, purchased.

OUR ASTRONOMICAL COLUMN.

THE NEW COMETS.—Numerous observations of Perrine's Comet and a few of Comet Brooks are reported in *Ast. Nach.*, No. 3320. The former is generally described as bright, the nucleus being about 7th magnitude, while the tail is pretty broad, and variously estimated at from 10′ to 20′ in length. From observations up to November 25, Dr. E. Lamp finds the date of perihelion passage to be 1895, Dec. 18·3509 Berlin mean time, and the following ephemeris is given:—

	R.A.			Decl.		Brightness.
	h.	m.	s.	°	′	
Dec. 11 ...	15	59	40 ...	−24	7·6 ...	28·30
12 ...	16	16	14 ...	26	2·1	
13 ...		34	33 ...	27	50·5	
14 ...	16	54	40 ...	29	25·0	
15 ..	17	16	5 ...	−30	37·4 ...	60·0

The unit of brightness is that on November 18. The comet is brightening with great rapidity, but it is so near the sun that observations can only be made in daylight.

Comet Brooks apparently presents only the appearance of a feeble, diffused nebulosity without condensation. The following ephemeris for Berlin midnight is due to Dr. H. Kreutz:—

	R.A.			Decl.		Brightness.
	h.	m.	s.	°	′	
Dec. 12 ...	7	16	42 ...	+57	23·5 ...	0·8
13 ...	7	0	37 ...	59	45·8	
14 ...	6	43	39 ...	61	48·0 ...	0·6
15 ...		26	4 ...	63	31·2	
16 ...	6	8	2 ...	64	56 7 ...	0·5
17 ...	5	49	52 ...	66	6·2	
18 ...		31	47 ...	67	1·4 ...	0·4
19 ...	5	14	6 ...	67	43·7	
20 ...	4	57	4 ...	+68	15·0 ...	0·3

The brightness on November 24 is taken as unity. According to the elements adopted, perihelion was passed on October 20·887.

It will be seen that the comet is now circumpolar.

THE GREAT COMET OF 1843.—In the *Astronomische Nachrichten*, No. 3320, Dr. Kreutz gives another chapter in the history of the three interesting comets of 1843 I., 1880 I., and 1882 II., all belonging to one cometary system, distinguished by great brilliancy and small perihelion distance. In 1889, Dr. Kreutz published an exhaustive monograph on the motion of the 1882 comet, that one of the system which, it will be remembered, was first seen in this country by Dr. Common, in bright daylight, and which at the Cape was followed till it seemed to touch the sun's limb. The present inquiry has reference to the 1843 comet, also seen and observed in full daylight, and the motion of which had been made the subject of a classical discussion by Dr. Hubbard (*Astronomical Journal*, vols. i. and ii.). The improved normal places which Dr. Kreutz has formed are not, however, very well represented by Hubbard's orbit, and new elements have been derived, which, of course, do not differ materially from the earlier results. The period, deduced as the most probable, is 512 years, or twenty years less than Hubbard's period; but the interesting point in the present discussion is the determination of several orbits with various values for the semi-axis major, assigned on the hypothesis that this comet of 1843 is identical with some other the appearance of which has been recorded. The periods assigned are thirty-six years, suggested by a possible identity between the 1843 and 1880 comets; 175 years, which would make the 1843 comet a reappearance of that in 1668; 800 years, a period approximately equal to that found for 1882 II., and finally a parabolic orbit. The result is to settle very decisively that there is no identity between the 1843 and 1880 comets, and almost as certainly that the comet is not a return of that of 1668. On the other hand, it is by no means certain that equal periods would not satisfy the observations in both 1843 and 1882, but true parabolic motion cannot be accepted. From the position of the line of intersection of the orbital planes of the two comets 1843 and 1882, Dr. Kreutz infers that they originally formed one comet, and that the separation into two distinct bodies was effected near the time of perihelion passage. Seeing that the 1843 comet would approach within 100,000 miles of the sun's surface, it is easy to suggest a cause for the subdivision.

NEBULOSITIES AROUND THE PLEIADES.—The nebulous relationships of the Pleiades, brought so forcibly into view by the beautiful photographs of Dr. Isaac Roberts, are carried a stage further by a photograph which we owe to Prof. Barnard. This was taken with the 6-inch portrait lens with a total exposure of 10h. 15m. on December 6 and 8, 1893, and an enlargement and description of the plate are given in the current number of *Knowledge*. In this photograph the nebulæ photographed by Dr. Roberts are submerged in the "burnt out" images of the brighter stars; outside the group various nebulous masses and streams are seen extending in all directions, but apparently connected with the nebulosities of the cluster itself. The most prominent of the new nebulosities are two irregular streams flowing from the north and south sides of the cluster, and running three or four degrees easterly; the northern stream is double for a part of its length, but the upper part is very feeble. The nebulosities have also been photographed by Dr. Wilson, of the Goodsell Observatory, with an exposure of 11 hours; they are best seen by increasing the contrast in a positive copy of the plate.

THE FIRST STEPS IN SERUM-THERAPY.

IN scientific discovery, as in many other walks of life, it frequently happens that the magnitude of the result achieved casts into obscurity the labours which led up to that discovery, just as the parent is often forgotten in the fame which may subsequently surround the work of his offspring. It is rarely, however, that so young an infant as we must perforce recognise antitoxic serum to be, succeeds in baffling the pedigree-hunter; barely recognised three or fours years back, its parentage has, however, already become the subject of much discussion.

Dr. Welch, of Baltimore, in an exhaustive paper[1] on the treatment of diphtheria by anti-toxin, commences with an historical survey of the subject, and states that Babès and Lepp in 1889 were the first to publish results of experiments to solve the question whether the fluids and cells of animals which have been rendered immune by vaccination, have not become vaccines and capable of protecting also other organisms. On turning, however, to the volume of the *Annales de l'Institut Pasteur*, in which the memoir by Babès and Lepp[2] on this subject is published, we find that they do not claim to have originated these investigations, for they expressly state: "We have seen, in the course of our investigations, that this problem has been studied experimentally in various diseases, and this fact encouraged us to pursue this idea."

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[1] "The Treatment of Diphtheria by Antitoxin," *Trans.* Association of American Physicians, vol. x., 1895.

[2] "Recherches sur la vaccination antirabique," *Annales de l'Institut Pasteur*, vol. iii., 1889.